

E.S.T.R.O.T. 7TH CONGRESS

FROM BENCH TO PATIENT BEDSIDE:
LATEST ADVANCES AND INNOVATIONS
IN TISSUE REGENERATION AND REPAIR



FINAL PROGRAM

CHAIRMAN: INGO MARZI



Bone regeneration
Cartilage regeneration
Nerve and muscle regeneration
Soft tissue reconstruction
Fracture related infection
Surgical techniques

3-5 JULY 2023 - FRANKFURT, GERMANY

TOPICS

— BONE REGENERATION

Non-union, bone defects, bone voids, avascular necrosis. The role of stem cells, Scaffolds, Growth factors, Composite grafts, Physical stimulation

— CARTILAGE REGENERATION

Matrices, scaffolds, chondrocyte re-implantation, biological response modifiers

— NERVE AND MUSCLE REGENERATION

Latest advances

— SOFT TISSUE RECONSTRUCTION

VAC devices, growth promoting factors
Artificial skin, composite flaps

FRACTURE RELATED INFECTIONS

Preventative strategies for bone infection
Modern treatment of osteomyelitis

— SURGICAL TECHNIQUES TO IMPROVE OUTCOMES

Osteosynthesis, distraction, arthroplasty



E.S.T.R.O.T.

European Society of Tissue Regeneration in Orthopaedics and Traumatology

BOARD

PRESIDENT:

Prof. Peter V. Giannoudis
Leeds, United Kingdom

PAST PRESIDENT:

Prof. Gerhard Schmidmaier
Heidelberg, Germany

TREASURER:

Prof. Thierry Bégué
Paris, France

ESTROT AMBASSADOR:

Scientific Committee Chair
Prof. Giorgio M. Calori
Milan, Italy

OBJECTIVES

The objectives of the Society are:

To relieve sickness in particular by advancing and promoting education and research in the treatment of musculoskeletal disorders.

To cover all matters relating to the progress and development of the field of tissue regeneration including surgery of bone, cartilage, muscle, nerve, skin, imaging techniques, rehabilitation and other related medical specialities.

To disseminate the useful results of tissue regeneration research into the medical profession.

To promote audit of hard and soft tissue reconstruction in relation to patient outcomes.

To guide European Tissue Regeneration Policies and to guide alliances of similar organisations from other continents.

INVITED SPEAKERS

Amling Michael, Hamburg DE

Arts Chris, Maastricht NL

Bégué Thierry, Paris FR

Bläser Andreas, Darmstadt DE

Blokhuis Taco J., Maastricht NL

Boecker Wolfgang, Munich DE

Buehren Volker, Murnau DE

Calori Giorgio, Milan IT

Docheva Denitsa, Wuerzburg DE

Duda Georg, Berlin DE

El Khassawna Thaqif, Giessen DE

Ferracini Riccardo, Turin IT

Frank Johannes, Frankfurt DE

Gebhardt Florian, Ulm DE

Gelinsky Michael, Dresden DE

Ghanaati Shahram, Frankfurt DE

Giannoudis Peter, Leeds UK

Grässel Susanne, Regensburg DE

Grillari Johannes, Vienna AT

Guerado Enrique, Malaga ES

Hildebrand Frank, Aachen DE

Hirche Christoph, Frankfurt DE

Henrich Dirk, Frankfurt DE

Huckstadt Marc, Halle DE

Hofmann Gunther, Jena DE

Ignatius Anita, Ulm DE

Jenei-Lanzl Zsuzsa, Frankfurt DE

Josten Christoph, Leipzig DE

Kobbe Philipp, Aachen DE

Löhning Max, Berlin DE

Marzi Ingo, Frankfurt DE

Madry Henning, Homburg DE

Mittelmeier Wolfram, Rostock DE

Nau Christoph, Frankfurt DE

Neijhoft Jonas, Frankfurt DE

Niemeyer Philipp, Munich DE

Poeze Martijn, Maastricht NL

Putzeys Guy, Kortrijk BE

Redl Heinz, Vienna AT

Rosado Balmayor Elizabeth, Aachen DE

Schmidmaier Gerhard, Heidelberg DE

Shen Ping, Berlin DE

Soehling Nicholas, Frankfurt DE

Stief Felix, Frankfurt DE

Trampuz Andrej, Berlin DE

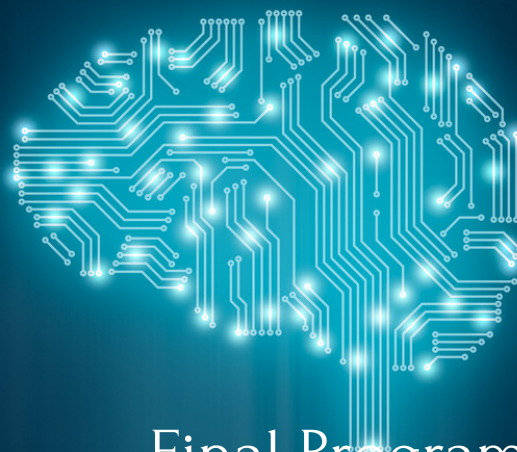
Van Griensven Martijn, Maastricht NL

Van Osch Gerjo, Rotterdam NL

Verboket René, Frankfurt DE

Wildemann Britt, Jena DE

Zaucke Frank, Frankfurt DE



Final Program

CONGRESS PRESIDENT:

Prof. Dr. Ingo Marzi

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and Department of Orthopedics
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09:30 Registration

10:25 Welcome Opening – P. Giannoudis, I. Marzi

10:30 **Session I: Bone Healing – New Insights**

Chairmen: I. Marzi, J. Grillari

10:30 New insights in the pathophysiology of bone healing - G. Duda

10:45 Mast cells – Crucial modulators of fracture healing - A. Ignatius

11:00 Role of microRNA in fracture healing environment: still important? - M. van Griensven

11:15 Circulating miRNAs in bone health and disease - J. Grillari

11:30 Situation after metal ion overload in metal/metal articulation: Is there a local bone regeneration? - W. Mittelmeier

11:45 **Free Paper Session**

11:45 The potential of scaffolds loaded with mouse iPSC and iPSC-derived extracellular matrix in treating critical size bone defects - F. Brueck

11:51 Can human MSC be frozen directly on the scaffold and used for bone defect grafting? - L. Leppik

11:57 One stage Masquelets technique - Evaluation of different forms of membrane filling - R. Verboket

12:03 Surgical trauma treatment surgery influences systemic inflammation and local fracture healing mechanism - R.M.V. Groven

12:09 Impact of TSG-6 on the healing of critical-sized defects of MICE - O. Kueppers

12:15 Mechanically induced WNT1 promotes osteoblast differentiation through plat - M. Ahmad

12:21 Summary

12:30 **Stryker Lunch Symposium open to all participants**

13:15

Poster Presentations - FOYER Building 22 Ground Floor

GROUP 1

Chairmen:
C. Nau
N. Soehling

Clinical Aspects of Bone and Cartilage Repair

GROUP 2

Chairmen:
R. Verboket
D. Henrich

Experimental Approaches for Bone Regeneration

GROUP 3

Chairmen:
F. Zaucke,
E. Rosado Balmayor

Clinical and Experimental Cartilage Research II

GROUP 4

Chairmen:
Z. Jenei-Lanzl
F. Stief

Clinical and Experimental Cartilage Research I

GROUP 1 - Poster Presentations

Chairmen: C. Nau, N. Soehling

Ganglion Cyst of the Foot and Ankle - How common is recurrence following surgical excision?

R. Patel, D. Sunderamoorthy, P. Lokanathan, P. Patil, S. Ganapathy Pandiyarajan, A. Kanamukkalu Narayanamurthy
The Princess Royal Hospital - Apley Castle, United Kingdom

Increasing bioactivity and compatibility of PLA/BG composites for bone tissue engineering - high Bioglass content makes the difference

N. Soehling, J. Neijhoft

University Hospital Frankfurt - Frankfurt, Germany

Aims and challenges in the management of severe open fractures. How promising is an interdisciplinary approach in a German Trauma Level I Centre?

S. Kuepper, N. Spranger

Burn Centre and Plastic Surgery BG Klinikum Unfall- Berlin, Germany

The application of Negative pressure wound therapy as a multistaged protocol in septic distal tibia nonunion

N. Di Cristofaro, G. Conza, L. Schiavo, G. Iodice, G. Landi, G. Toro

University of Campania "Luigi Vanvitelli" - Naples, Italy

Effectiveness of the "Diamond Concept" in the treatment of multifocal non-union of the forearm. A small series and a review of the literature

G. Iodice, G. Conza, N. Di Cristofaro, L. Schiavo, A. De Cicco, G. Toro

University of Campania "Luigi Vanvitelli" - Naples, Italy

Superior capsular reconstruction for irreparable rotator cuff tears: a single surgeon experience

R. Patel, L.M. Ahmed, S.J. Rhee

The Princess Royal Hospital - Apley Castle, United Kingdom

13:15

GROUP 2 - Poster Presentations

Chairmen: R. Verboket, D. Henrich

The use of antibiotic- impregnated cancellous bone grafts in one-stage surgery for long bone fracture related infections: a case series

G. Putzeys, K. Dendoncker

Az Groeninge - Kortrijk, Belgium

Ex vivo pretreatment of mesenchymal stem cells with electrical stimulation as strategy to improve bone tissue engineering outcomes

S. Bianconi, L. Leppik, K.L. Klein, J. Wolf, A. Schaible, K. Michelin Oliveira, J. Barker, I. Marzi, D. Henrich

University Hospital Frankfurt - Frankfurt, Germany

MSCs and Bioscaffolds in Complex Orthopedic Surgery: our research for the future

N. Crippa Orlandi, N. Mondanelli, S. Giannotti

University of Siena - Siena, Italy

Evaluation of the local effects of PMMA spacers loaded with antimicrobial drugs on the osteogenic of hMSCs

J. Hofmann, T. Bewersdorf, U. Sommer, C. Schamberger, T. Grossner

University Hospital Heidelberg - Heidelberg, Germany

3D-printed polycaprolactone/tricalcium phosphate cages for posttraumatic critical size bone defects, a research proposal for randomised controlled trial

A.J.L. Lodewijks, R.V.M. Groven, T.J. Blokhuis, L. van der Broeck, M. van Griensven, M. Poeze

Maastricht University - Maastricht, the Netherlands

Fabrication and characterisation of Antibacterial and Osteoconductive Properties of Chitosan- Cerium Oxide Scaffolds

L. Yildizbakan, N. Iqbal, P. Ganguly, T. Do, E. Jones, P. Giannoudis, A. Jha

University of Leeds - Leeds, United Kingdom

GROUP 3 - Poster Presentations

Chairmen: F. Zaucke, E. Rosado Balmayor

Cathepsin expression in human fracture hematoma is associated with fracture healing phases and patient age
R.V.M. Groven, D. Meesters, F. Lu, M. van Griensven, M. Poeze, R. Shiri-Sverdlov, T.J. Blokhuis
MERLN Institute for Technology-Inspired Regenerative Medicine - Maastricht, the Netherlands

2 year clinical and radiological follow up of a maioregen biomimetic osteochondral scaffold for a femoral head fracture
C. Galante, M. Motta, M. Domenicucci, S. Cattaneo, A.A. Spreafico, P. Capitani, G. Milano, A. Casiraghi
ASST degli Spedali Civili di Brescia - Brescia, Italy

Osteoarthritis patients exhibit a sympathovagal imbalance
R. Sohn, T. Assar, S. Braun, M. Brenneis, I. Kaufhold, F. Zaucke, Z. Jenei-Lanzl
University Hospital Frankfurt - Frankfurt, Germany

PGE2 exerts antihypertrophic effects and demands adjustment of OA analgesia
S. Schmidt, F. Klampfleuthner, S. Diederichs
University Hospital Heidelberg- Heidelberg, Germany

Adipose derived mesenchymal stem cells conditioned medium: applications in diabetic tendinopathy
M.C. Trotta, C.C. Lepre, M. Russo, M. Schiavone, T. Coppola, A. Iтро, A. Braile, G. Toro
University of Campania "Luigi Vanvitelli"- Naples, Italy

The composition of the extracellular and pericellular matrix of articular cartilage in relation to cartilage thickness
L. Weimer, A.E. Rapp, R.M. Phillips, A.M. Smith, F. Zaucke, I. Brandlin
Frankfurt University of Applied Sciences- Frankfurt, Germany

Anti-Osteoporotic Effects of Periosteal Stem Cell Derived Exosomes containing Biphosphonates
O. Eren, M. Yildirim, B. Kabatas, N. Unsal, F. Sahin
Fatih Sultan Mehmet Research and Training Hospital - Istanbul, Turkey

GROUP 4 - Poster Presentations

Chairmen: Z. Jenei-Lanzl, F. Stief

The role N1-N2 Neutrophil Phenotypes in Bone Regeneration: a Systematic Review

F. Lu, S.M.N.E. Verleg, R.V.M. Groven, M. van Griensven, M. Poeze, T.J. Blokhuis

Maastricht University - Maastricht, the Netherlands

TLR1/2 stimulation in human primary chondrocytes had little impact on autophagy

Y. Dai, X. Liu, S. Serve, P. Wu, P. Shen, M. Loehning

Deutsches Rheuma-Forschungszentrum(DRFZ) - Berlin, Germany

Evaluation of efficacy of pooled human platelet lysate (pHPL) as a growth supplement for clinical grade chondrocytes culture

P.K. Javaregowda, M. Goni, S.S. Jeevannavar

SDM College of Medical Sciences & Hospital - Dharwad, India

Distance mapping of the ankle to assess changes of interaction between articular surfaces after corrective arthroscopic anterolateral subtalar arthrodesis

A. Bernasconi, A. Izzo, C. Fernando, F. Lintz

Azienda Ospedaliera Universitaria Federico II UOC - Naples, Italy

The addiction of amino acids boosts the positive effects of hyaluronic acid injection in knee osteoarthritis. Early results from the Hyaloplus protocol

L. Schiavo, G. Iodice, G. Conza, L. Mottola, N. Di Cristofaro, A.B. Cecere, E. Iannelli, V. Desiderio, G. Toro

University of Campania "Luigi Vanvitelli" - Naples, Italy

In vitro culture mesenchymal stem cell-derived chondrocytes under cyclic motion

C. Sanchez Perez, F.J. Narbona Carceles, F. Chana Rodriguez, F.J. Vaquero Martin, M.E. Fernandez Santos, R. Couceiro Otero, D.M. Crego Vita

Hospital General Universitario Gregorio Marañón - Madrid, Spain

Bone wax in the treatment of partial epiphysiodesis of the distal femur growth cartilage. Case report at 10 years of follow-up.

L.Basiglini, M.Marsiolo, F.Falciglia

Ospedale Bambin Gesù - Rome, Italy

14:00 Session II: Scaffolds - New Structures

Chairmen: H. Redl, F. Gebhard

14:00 3D printing and bioprinting of complex osteochondral constructs - M. Gelinsky

14:15 Fiber-reinforced bioinks as multi-functional building blocks in hybrid 3D-bioprinting- A. Bläser

14:30 Bioprinting with new filaments - J. Neijhoft

14:45 Surgical treatment of traumatic bone defects using 3D printed scaffolds - M. Poeze

15:00 Free Paper Session

15:00 Porous tubelike structures made by 3D-printed polylactic acid improves large bone defect healing in a femur defect model of the rat - impact of lumen diameter - N. Soehling

15:06 The osteoconductive and antibacterial responses of photothermally treated biphasic Al₂O₃-TiB₂ - TiO₂/CuO / CeO₂/ CaO Scaffolds - E. Daskalakis

15:12 Physicochemical and Biological Characterisation of Chitosan Scaffolds from Crustacean and Fungal Sources - N. Iqbal

15:18 Investigating the feasibility of utilizing a bioink consisting of self-expanding hydrogel and bone marrow aspirate for tissue regeneration - R. Jamous

15:24 Summary

15:30 Industry Session: Keynote Lecture 20 minutes - 5 minutes Discussion

16:00 Coffee Break

16:30 **Session III: Cartilage Repair – Latest Advances**

Chairmen: G. van Osch, F. Zaucke

- 16:30 Translational Cartilage Regeneration: From matrices to biological response modifiers - H. Madry
- 16:45 Autologous adipose tissue extract for the treatment of osteoarthritis: A 5 year follow up experience - R. Ferracini
- 17:00 Articular Cartilage Repair via Extracellular Vesicles - S. Grässel
- 17:15 Hydrogels and how their properties influence cartilage repair - G. van Osch

17:30 **Free Paper Session**

- 17:30 Guiding nasal chondrocytes through 3D bioprinted design to generate an osteochondral tissue - E.B. Tankus
- 17:36 Respondins are prohypertrophic stimulators of chondrocyte mineralization - S. Diederichs
- 17:42 Aggrecan 32-Mer impairs mitochondrial respiration capacity of human chondrocytes via TLR2 - X. Liu
- 17:48 Chronic stress accelerates osteoarthritis progression in vivo - G. Roesch
- 17:54 Summary

20:00 **Welcome Reception – Senckenberg Museum, Frankfurt**

7:30 **ESTROT BOARD MEETING**

8:30 **Session IV: Infection Still an Unresolved Issue?**

Chairmen: E. Guerado, G. Hofmann

8:30 Diagnostic of fracture related infection update of current evidence - A. Trampuz

8:45 Old and new way to treat osteomyelitis: Antibiotics and beyond - various biomaterials for osteomyelitis treatment - C. Arts

9:00 Implant modification to prevent infection - B. Wildemann

9:15 Prophylaxis and treatment of FRI by local AB delivery with bone chips - G. Putzeys

9:30 **Free Paper Session**

9:30 Fracture related infections and their risk factors for treatment failure - a major trauma centre perspective - R. Patel

9:36 Implant retention with serial debridement and use of antibiotic-loaded calcium sulfate beads in acute fracture-related infection (FRI) after pelvic ring or acetabular fractures: a retrospective case series of 7 series - A. Casiraghi

9:42 Can antibiotic-impregnated bone grafts in aseptic secondary bone surgery prevent infection? A clinical case series
G. Putzeys

9:48 Rifampicin-loaded polymethylmethacrylate: is it possible to preserve mechanical properties and setting time?
E. Carbò-Laso

9:54 Struggling with a cefazolin impregnation protocol of bone chips. The effect of the timing of the impregnation and gamma-irradiation of the cefazolin release - K. Dendoncker

10:00 Clinical, histological and radiographic evidence of new bone formation at the periphery of bone defects using antibiotic-loaded calcium sulfate beads in bone transports - M. Domenicucci

10:06 Summary

10:20 **Coffee Break**

10:45 Session V: Fracture Non-union - Can we do better?

Chairmen: G. M. Calori, V. Bühren

10:45 Treatment of bone defects and non unions; more than autografts - T. Blokhuis

11:00 Non union: Molecular genetics and therapeutic osteology - M. Amling

11:15 Giannoudis: When and how I use the diamond concept? - P. Giannoudis

11:30 The NUSS (non union scoring system) classification and the Algorithm of treatment - G. M. Calori

12:00 Session X: Free Paper Session

12:00 Bone defects greater than 6 cm in the lower extremity: is the induced membrane technique associated with favorable outcomes? - V. Giannoudis

12:06 The induced membrane technique improves the health-related quality of life in patients with a post-traumatic long bone non-union - L. van der Broeck

12:12 Severe intraoperative vascular bleeding as main complication of acetabular fractures treated with plate osteosynthesis via the modified Stoppa approach - J. Riemenschneider

12:18 Tissue impregnated bone substitutes for the promotion of bone healing - E. Papaeleftheriou

12:24 Summary

12:30 Session VI: Video Session: Surgical Techniques

Chairmen: P. Giannoudis, C. Josten

12:30 AVN - P. Giannoudis

12:40 Magaprostheses - G.M. Calori

12:50 Different variants of Masquelet-Techniques - M. Huckstadt

13:00 Injection of stem cells and PRP - P. Giannoudis

13:10 Discussion

13:15 **Greenbone Lunch Symposium**

14:00 **Session VII: Pathophysiology of musculo-skeletal healing**

Chairmen: H. Redl, E. Rosado Balmayor

14:00 Bone healing phases after transcript therapy – what do we know? - E. Rosado Balmayor

14:15 NOS inhibition reverses TLR2-induced chondrocyte dysfunction and attenuates age-related osteoarthritis - P. Shen, M. Löhning

14:30 Tubular structures to improve experimental bone healing - D. Henrich

14:45 Tendon healing: can it be upgraded? - D. Docheva

15:00 **Free Paper Session**

15:00 CD4/CD8 T-Cells as prognostic biomarker to early identify patients with risk for impaired Achilles tendon healing
F. Klatte-Schulz

15:06 Achilles tenocytes from diabetic and non diabetic donors exposed to high - or normoglycemic conditions respond differentially to inflammatory stimulus - E. Frank

15:12 A novel marker of Wound Response: the Phosphorylated Ribosomal Protein S6 - N.A.R. Ring

15:18 Vancomycin pharmacokinetics and activity in a novel in vivo model of orthopedic device-related infections: comparison with in vitro data - R. Buzisa Mbuku

15:24 Platelet Rich Plasma (PRP) injection therapy for Plantar Fasciitis - is it effective? - R. Patel

15:30 Summary

15:45 **Coffee Break**

16:15 **Session VIII: Biological Approaches to Cartilage and bone preservation**

Chairmen: H. Madry, T. Begué

16:15 The main problem of osteopenic bone in hip fracture is protein - E. Guerado

16:30 Cartilage cell transplantation - P. Niemeyer

16:45 Do stem cells work? - I. Marzi

17:00 Stem cell therapy in fracture healing - W. Boecker

17:15 Cartilage Repair - the Translational Perspective - H. Madry

17.30 **Free Paper Session**

17.30 Matrix-Associated Autologous Chondrocyte Implantation (MACI) in the knee - F. Maroski

17.36 Treatment of gonarthrosis with stromal-vascular fraction results after two years follow up - K.W. Labarre

17.42 Functional and arthroscopic outcomes in Indian patients with osteochondral lesions of the knee treated by standalone microfracture technique - S.S. Jeevannavar

17.48 Effects of cartilage extracellular matrix components on osteoarthritis-relevant cells - A.E. Rapp

17.54 Can adipose derived mesenchymal stem cells injection improve functional outcome and delay surgery in patients with hip osteoarthritis? A case control study with 36 months follow up - G. Conza

18.00 Treatment protocol for hip osteoarthritis based on stem cells from adipose tissue: comparison with PRP-based analogue
M. Rucci

18.06 Adipose stem cells harvesting and processing techniques. Correlation between treatment techniques and success rates of cells - F. Colao

18.12 Summary

20:00 **Faculty Dinner - Social Evening for all delegates**

8:30 **Session IX: Bone defect treatment: surgical and new translational approaches**

Chairmen: F. Hildebrand, G. Schmidmaier

8:30 The current way of 'Masquelet Technique' - T. Bégué

8:45 New Insights in Masquelets technique- insights from translational research - C. Nau

9:00 Convergence of scaffold guided bone regeneration and RIA bone grafting - P. Kobbe

9:15 Bone substitute materials in the context of digital medicine - T. El Khassawna

9:30 Evidence for reconstruction of large bone defects - G. Schmidmaier

9:45 Round Table Discussion

10:00 **Coffee break**

10:30 **Award Ceremony**

11:00 **Session X: The interaction of soft tissue and bone regeneration**

Chairmen: J. Frank, P. Giannoudis, T. Bégué

11:00 Composite flaps in soft and bone tissue - C. Hirche

11:15 Perspective Lecture: Bone Reconstruction - H. Redl

11:30 PRF in soft tissue and bone repair - S. Ghanaati

11:45 Round Table Discussion

12:15 Closure

Lunch Packages

REGISTRATION

REGISTRATION FEES (VAT included)	UNTIL 31/05/2023	FROM 01/06/2023
Medical Doctors Member	200,00 €	250,00 €
Medical Doctors - Non Member	350,00 €	• € 400,00 • Joining ESTROT membership will imply members registration fee
Scientist, Residents and Researchers	75,00 €	100,00 €
Students, Physiotherapists and Nurses	50,00 €	75,00 €
Exhibitors	150,00 €	200,00 €
One day registration Member	100,00 €	150,00 €
One day registration Non Member	150,00 €	200,00 €
SOCIAL DINNER	tbd	tbd

*E.S.T.R.O.T. MEMBERSHIP FREE FOR 2023!

AWARDS

AWARDS FOR CLINICIANS	
Free papers	
Gold	€ 1.000,00
Silver	€ 500,00
Bronze	€ 250,00
Poster	€ 250,00
AWARDS FOR SCIENTISTS	
Free papers	
Gold	€ 1.000,00
Silver	€ 500,00
Bronze	€ 250,00
Poster	€ 250,00

LOCATION



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